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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,742	11/28/2005	Katsuaki Hosono	09852/0202846-US0	9321

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EXAMINER	
TRIEU, THERESA	
ART UNIT	PAPER NUMBER
3748	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/532,742	HOSONO, KATSUAKI	
	Examiner	Art Unit	
	Theresa Trieu	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2008 and 01 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/11/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is responsive to the applicant's amendment filed on Apr. 11, 2008 and Feb. 1, 2008.

Claims 1-6 and 8 have been amended. Claim 7 has been canceled. Claims 9 and 10 have been added. Accordingly, claims 1-6 and 8-10 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosono (Patent Number 6,077,059) in view of Wenker (Patent Number 5,030,072).

Regarding claims 1 and 3, Hosono discloses an oil pump rotor assembly comprising: an inner rotor 10 having "n" external teeth ("n" is a natural number); and an outer rotor 20 having (n+l) internal teeth which are engageable with the external teeth, wherein the oil pump rotor assembly is used in an oil pump which, during rotation of the inner and outer rotors, draws and discharges fluid by volume change of cells C formed between the external teeth of the inner rotor and the internal teeth of the outer rotor engaging therewith, wherein the volumes of the cells increase along a rotational direction of the inner rotor and the outer rotor, However, Hosono fails to disclose a clearance defined between the external and internal teeth.

Regarding claims 1 and 3, Wenker (as shown in Figs. 3 and 4) teaches that it is conventional in the art to utilize clearances defined between the external teeth and the internal

teeth engaging therewith also increase along the rotational direction, wherein when the clearances are defined such that: one of the clearances that corresponds to, having the minimum volume, is designated as "a", another clearance that corresponds to the cell having the maximum volume is designated as "c"; and the other clearances that correspond to the cell whose volume is increasing during rotation of the inner rotor and the outer rotor and are arranged between the clearance "a" and the clearance "c" are designated as "b", the following inequalities are satisfied: $a \leq b \leq c$, and $a < c$, and wherein when the clearance "b" of the cell positioned backward as viewed in the direction of rotation is further designated as "b1", and the clearance "b" in the cell positioned forward as viewed in the direction of rotation is further designated as "b2", the following inequality is satisfied: $b1 < b2$. With regard claims 2 and 4, Wenker further discloses the volumes of the cells decrease along the rotational direction of the inner rotor and the outer rotor such that the clearances also decrease along the rotational direction, and wherein when the clearance that corresponds to the cell , whose volume is decreasing during rotation of the inner and outer rotors~ is designated as "d", the following inequalities are satisfied: $a \leq b \leq c$, $a < c$, and $a \leq d \leq c$, and wherein when the clearance "d" in the cell positioned backward as viewed in the direction of rotation is further designated as "d1", and the clearance "d" in the cell positioned forward as viewed in the direction of rotation is further designated as "d2", the following inequality is satisfied: $d1 \geq d2$; the clearance gradually decreasing as the cell rotationally moves from a position at which the volume of the cell is maximized to a position at which the volume of the cell is minimized. It would have been obvious to one having ordinary skill in the oil pump art at the time the invention was made, to have utilized the clearance between the external and

internal teeth, as taught by Wenker in the Hosono apparatus, since the use thereof would have improved the efficiency of the gerotor.

Regarding claim 5, as shown in Figs. 1-3, Hosono '059 teaches that it is conventional in the gear pump art to utilize the tooth surfaces of the inner and outer rotors (10, 20) being respectively formed using cycloid curves which are formed by rolling respective rolling circles along respective base circles (Bi, Bo) without slip (see claim 1). With regard claim 8, Hosono '059 further discloses wherein each of the tooth profiles of the inner rotor is formed such that the tip profile thereof is formed using an epicycloid curve which is formed by rolling a first circumscribed-rolling circle Di along a base circle "bi" without slip, and the tooth space profile thereof is formed using a hypocycloid curve which is formed by rolling a first inscribed-rolling circle "di" along the base circle "bi" without slip, and each of the tooth profiles of the outer rotor is formed such that the tip profile thereof is formed using an epicycloid curve which is formed by rolling a second circumscribed-rolling circle Do along a base circle "bo" without slip, and the tip profile thereof is formed using a hypocycloid curve which is formed by rolling a second inscribed-rolling circle "do" along the base circle "bo" without slip, and wherein the inner rotor and the outer rotor are formed such that the following equations and inequalities are satisfied: obi=n(oDi+odi); obo=(n+1)-(oDo+odo); one of oDi+odi=2e and oDo+odo=2e; oDo>oDi; odi>odo; and (oDi+odi)<(oDo+odo), where obi is the diameter of the base circle "bi" of the inner rotor, oDi is the diameter of the first circumscribed-rolling circle Di, odi is the diameter of the first inscribed-rolling circle "di", obo is the diameter of the base circle "bo" of the outer rotor, oDo is the diameter of the second circumscribed-rolling circle Do, odo is the diameter of the

second inscribed-rolling circle "do", and "e" is an eccentricity distance between the inner and outer rotors (see col. 5, line 65-67 – col. 6, lines 1-40, col. 8, line 1-50 and see claims 1 and 2).

2. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosono '059 in view Wenker as applied to any claim 1 above, and further in view of Hosono et al. (Hosono) (Patent Number 5,813,844).

The modified Hosono '059 discloses the invention as recited above; however, the modified Hosono fails to disclose tooth surfaces of the inner rotor and tooth tips of the outer rotor.

Hosono '844 (as shown in Figs. 1 and 3) teaches that it is conventional in the gear pump art to utilize the tooth tips 21 of the outer rotor 20 being formed using an arc having the same radius as that of the trajectory circle. Furthermore, Hosono '844 (as shown in Fig. 2) discloses the tooth surfaces 11 of the inner rotor 10 being formed using a trochoid envelope curve (t) which is formed by moving a trajectory circle, whose center is positioned on a trochoid curve, along the trochoid curve (t). It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized tooth surfaces of the inner rotor and tooth tips of the outer rotors, as taught by Hosono ' 844 in the modified Hosono' 059 apparatus, since the use thereof would have reduced the resistance which is generated by each of the sliding parts in the inner and outer rotors and the casing and ensured the oil pump's durability and reliability.

3. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hosono '059 in view Wenker.

The modified Hosono '059 discloses the invention as recited above; however, the modified Hosono fails to disclose the value "a" is in the following range: $0.010 \text{ mm} \leq a \leq 0.040$

mm; and the value "c" is in the following range: 0.040 mm $\leq c \leq 0.150$ mm. It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the range of the value "a" and "c", since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 220F.2d 454,456, 105 USPQ 233, 235 (CCPA 1955) (see MPEP §2144.05).

Prior Art

4. The IDS (PTO-1449) filed on April 11, 2008 has been considered. An initialized copy is attached hereto.

Response to Arguments

5. Applicant's arguments with respect to claims 1-6 and 8-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Applicant is duly reminded that a complete response must satisfy the requirements of 37 C.F.R. 1.111, including: "The reply must present arguments pointing out the specific distinctions believed to render the claims, including any newly presented claims, patentable over any applied references. A general allegation that the claims "define a patentable invention" without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of this section. Moreover, "The prompt development of a clear Issue requires that the replies of the applicant meet the objections to and rejections of the claims." Applicant should also specifically point out the support for any amendments made to the disclosure. See MPEP §2163.06 II(A), MPEP §2163.06 and MPEP §714.02. The "disclosure" includes the claims, the specification and the drawings.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa Trieu whose telephone number is 571-272-4868. The examiner can normally be reached on Monday-Friday 8:30am- 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on 571-272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TT
April 16, 2008

/Theresa Trieu/
Primary Examiner, Art Unit 3748